

But we must remember that it occurs in only some 50 or 60 per cent of cases, and that it may occur entirely independent of thyroid disease.

Too much reliance should not be placed on the value of basal metabolism readings. Like other laboratory findings they are to be interpreted as corroborative and confirmatory aids in reaching a correct diagnosis, and then only when taken under proper conditions with an apparatus known to be accurate and by a technician known to be fully competent.

The statement is made that since the advent of the iodine preparatory treatment the surgical mortality has been reduced to less than one per cent. This statement might easily prove misleading. Such results are obtained when the surgery is done by experienced operators. But the mortality rate is much higher in the hands of the inexperienced. Here 10 per cent would probably be a more correct figure.

Doctor Magee's address is a good presentation of the management of exophthalmic goiter, embodying the best that is known on the subject at the present time.

## ATHLETIC INJURIES\*

By PACKARD THURBER, M.D.  
Los Angeles

DISCUSSION by Harold H. Hitchcock, M.D., Oakland; George O. Berg, M.D., Los Angeles; E. F. Roth, M.D., Palo Alto.

GENERALLY speaking, athletic injuries differ little from injuries caused by other means. However, there are certain conditions that are at least common, if not peculiar, to athletic endeavor, and therefore the prevention and treatment of these injuries cause us to digress from the usual methods of treatment in certain instances.

### STAFF ORGANIZATION

Not so many years ago, most injuries, at least on the field of competition, were given first aid by "trainers" or "rubbers," but I believe that at present practically all of the universities maintain a well-organized medical department, with a regularly licensed physician in charge. At the University of Southern California the Athletic Medical Department adjoins the Varsity dressing rooms, and is comprised of minor surgery, x-ray, hydrotherapy, massage, and examination rooms. The personnel consists of the medical director, two assistant surgeons, dentists, masseurs, and historian.

All of the above are on active service during the athletic year and, in addition, we have a consulting staff of representative men in their respective specialties.

### EXAMINATIONS OF CANDIDATES

At the beginning of the athletic season a complete physical examination is given all candidates, including complete dental x-rays and mouth charts. Helmets, shoulder-pads, hip-pads, shoes, and other equipment are checked to forestall avoidable injuries. Team members are then advised that, while the University does not assume responsibility for injuries resulting from athletic competition, they offer the services of their medical department; but if the athlete so desires he has the privilege of securing other medical attention at his own expense. In any event, an injured athlete must be examined and passed as fit for further com-

petition by the University medical staff. All minors are instructed to obtain operative permits from their parents or guardian, and these are filed for use in case of emergency.

The director of athletics sends a program of events to the medical director's office each Monday morning and arrangements are then made for one of the staff doctors to be in attendance at all contests wherein the University is host. Consequently, injured athletes are extended immediate treatment by a registered, licensed physician.

### FITNESS TO ENGAGE IN SPORTS

In our organization the medical director determines the fitness of an athlete to continue competition, and we are, therefore, confronted at times with rather serious responsibility because many of the athletes are minors, and during the most athletic contests we are restricted to two or three minutes to diagnose, treat and decide whether or not the patient shall be withdrawn from the contest. We are aided, however, in this respect by the fact that we are familiar with the physical condition, reactions, temperament and peculiarities of the individuals, since they are under our direct observation practically every day during each athletic season. Furthermore, at times we use a few fundamental rapid tests on the field, such as the Rhomberg, eye-reflexes, et cetera, in concussion cases, and determine their mental equilibrium by asking questions pertinent to the particular athletic endeavor in which they are engaged at the time of injury.

It is somewhat superfluous to remind you that the members of these athletic teams are all anxious to reach the top and remain there; and while we dislike to disqualify them, nevertheless we recommend substitution where an injury creates a special hazard. We believe it fair to assume that the athletes and their parents are aware of the possibility of injury under ordinary circumstances, but where a condition materially increases the hazard we acquaint the parent with our findings and abide by their decision. In rare cases, of course, where the issue is clear the medical director recommends absolute retirement.

A few words concerning another phase of the subject, wherein it differs from private practice, may be said in connection with the importance of keeping the athletes in active competition. You all know that track, basketball, baseball, football, and the other athletic seasons are of relatively short duration, and that, in many cases, with special protective apparatus and the consent of the parents, we permit the player to continue; whereas in private practice we would probably restrict a patient's activity. Necessarily, these special splints that we use must be of light weight, small proportion, and conform to certain rules and regulations, designed to protect the other players from injury.

### TYPES OF INJURIES

Obviously, our most common injuries are acute sprains, such as the acromioclavicular joint (shoulder joint); subacute sprains, following repeated strains, such as attachments of pronator teres, flexor and extensor groups at the elbow (golf and tennis elbow); strains of the anterior tibial group

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attachments (shin splints); severe, deep muscle contusion with hemorrhage (Charley horse); contusion with avulsion muscle attachments pelvic rim (hip point); abrasions (floor burns); bursitis, tenosynovitis, dislocated finger joints, knee cartilage and ligament injuries, and, early in the season, blebs, intertrigo (jock strap itch), dermatomycosis (athlete's foot), etc. The less common and more severe types are the concussions (brain and chest), fractures, major dislocations (shoulder, elbow), etc.

#### TREATMENT

With regard to treatment, while there are many different types and methods, we feel that fundamentally our most valuable assets are:

1. *Anatomical Relocation of Injured Tissues.*—In this connection I more particularly refer to sprains, torn ligaments, and strains of muscular attachment about joints, because in these conditions the essential pathology consists of a small area of effusion at the point of trauma, and the pain is due to tension or pressure on this effusion. Whether the repair of damage is by first intention or becomes a subacute or chronic condition, depends upon the treatment instituted. If the effusion is absorbed and the torn ends of tissues approximated and maintained in their normal position for a sufficient period of time, prompt and complete repair will ensue. "Sufficient time" is ten days to two weeks, we believe, except in the very severe cases. Conversely, if the damaged area is subjected to repeated assault by muscular effort or other movement, stretching and tearing of the newly formed repair tissue take place and create a subacute or chronic process by producing a small plexus of fibrous tissue which, in turn, impedes circulation and, therefore, the complete absorption of the effusion.

2. *Heat and Massage.*—These are used according to accepted methods.

3. *Supportive Treatment.*—Under this heading are grouped compression bandages, elastic bandages, taping over adhesive, and sponge rubber pads, etc., and these assume an important rôle in treatment. The problem of "athlete's foot" and allied skin conditions have been adequately controlled for the past several years by water-cooled quartz lamps and thorough removal of moisture between the toes, following the shower.

A word about knee cartilages: My observations, while operating on these joints, lead me to the conclusion that forced manipulation of a locked knee is seldom justified. In those instances where a knee will not unlock within two or three days with relaxation, our operative findings usually indicate the futility of forced manipulation, in so far as any permanent relief is concerned.

#### CONCLUSIONS

Considering the opportunity for physical damage, we believe that the standard protective equipment, including special splints and apparatus, is satisfactory; but, of course, all injuries cannot be prevented.

Good physical condition and consummate effort tend to forestall injury. For example, many injuries

in football practice occur in so-called dummy scrimmage, where maximum physical effort is not exerted.

It is of prime importance to allow acute injuries "sufficient time" to heal by primary intention.

Manipulation of injured members should be avoided until a definite diagnosis has been made.

Athletes with known physical ailments, creating a serious extra hazard to injury, should be disqualified.

The National Collegiate Athletic Association, through its proper committees, has done much in the way of rule changes to eliminate injuries.

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#### DISCUSSION

HAROLD H. HITCHCOCK, M. D. (1624 Franklin Street, Oakland).—The method of handling injuries among athletes does not vary much in our American colleges, since the gate receipts from football has put the average college into big business.

The diagnosis and outline for treatment, as well as the decision as to when the man shall return to competition, has been taken away from the coach and trainer and put into the hands of trained medical men with a corps of consulting specialists. It is true that coach and trainer still attempt to exert their influence by calling men yellow at times who claim to have been injured, or try to bring undue influence on the athletic physician to permit an excellent player to return to competition before he should.

It is our feeling that the cheers of the multitudes in the bleachers soon die out; that too many athletes are better endowed with physique than brains, and if this physique is ruined because of permitting them to compete while injured in college, that an irreparable damage has been done, both to the student and to the sport in which he competes.

In dealing with athletic injuries in our American colleges, most of the patients are between eighteen and twenty-four years of age and are excellent physical specimens. There are certain fairly common congenital and developmental conditions which predispose some men to back injuries such as prespondylolisthesis and congenital anomalies of the low back and juvenile kyphosis with Schnorl's changes.

We feel that all injuries should have good x-rays when there is any chance of bone or joint injury. This practice has shown us many fractured carpal scaphoids that would have been missed and called sprained wrists, many fractured laminae in the spine, many congenital anomalies of the spine, which are a factor in making their backs more vulnerable.

Injuries to the lateral ligaments in the knee that are severe enough to permit lateral instability are treated by immediate open operation and repair. Knees that fill quickly with fluid after injury are aspirated, as they usually contain blood. We do not aspirate if we feel the fluid is a simple effusion in the knee. Exercises for the quadriceps muscles are begun at once. The patient is not permitted to return to competition until this muscle has returned to normal. Injuries to the semilunar cartilage and fat pads are common. If a cartilage is injured it is removed, otherwise the knee does not return to normal. The only place for manipulation in the treatment of knee-cartilage injuries is for temporary relief.

Muscle injuries in track athletes sometimes appear trivial, but result in grave consequences if they are permitted to run. I have seen spiral fractures of the tibia and fibula occur from the calf muscle contracting. Michigan's two-mile runner had had a sore calf for two weeks before competing against California this year. In that race the calf contracted, he heard and felt his leg bones break, and then fell and pushed the tibia through the skin to compound the fracture.

I have twice seen the humerus broken in throwing a ball by a player with a sore arm.

We feel that all broken necks should be prevented from further athletic competition.

In football we find more injuries occur in a poorly conditioned, a fatigued or dazed man, or in a team that is demoralized and receiving a severe beating. These individuals are slowing up, not coordinating, and are apt to be injured.

If college athletics are to continue, especially football, those entrusted with the care of injured athletes must have the courage to keep any injured man from competition until he has completely recovered and is not suffering additional risk by virtue of his recent injury.

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GEORGE O. BERG, M.D. (6253 Hollywood Boulevard, Los Angeles).—In athletics we have preventive medicine as well as curative. We use all of the known principles in both fields, and we augment the first with suitable protections for all injuries.

We deal with men in a remarkable state of health. They recover rapidly, and most of them are fired with the ambition to compete. Many will hide injuries, and a small minority will magnify injuries. We are seeing a rapid evolution and change in the methods of diagnosis and care of injuries. The old-time "punch drunk" type of trainer is being replaced by men of training and sympathetic outlook.

In general, I agree with Doctor Thurber's comments on types and treatment of injury. Let me say that the common injury, known as charleyhorse, was studied scientifically by me at the University of Wisconsin ten years ago. By pathologic material from dogs I proved that the various stages such an injury goes through are:

1. Hemorrhage and serous swelling between muscle bundles, occurring chiefly close to the bone.
2. Subperiosteal hemorrhage.
3. Excavation of necrotic muscle tissue by polymorphonuclear leukocytes.
4. The formation of fibrin.
5. Change of this to the fibroblast.
6. Metamorphosis of the fibroblast to connective tissue cells.
7. The development of the connective tissue cell as a bridge.
8. The burrowing through an area of scar tissue by muscle-buds springing from uninjured muscle tissue with burrowing buds loaded with juvenile types of cellular nuclei in a manner similar to the function of the osteoblast.
9. Union of these buds and restoration of tissue, as well as function, provided we have not insulted nature by reinjury.

We use all standard methods of physiotherapy in treatment.

At this time I desire to warn this group against acceptance of unsupported statements by unscrupulous manufacturers that radiotherapy apparatus will not burn. Such a statement is untrue. We have had the misfortune of having a severe burn occur while treatment was being given under the direction of the demonstrator employed by one of these companies.

I have been successful in getting several cases of dislocated semilunar cartilages to heal with a reliable knee-joint resulting. This has been possible through immediate reduction of the dislocation under anesthesia and immediate application of a plaster cast and bed rest for two weeks following by appropriate physiotherapy.

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E. F. RORH, M.D. (300 Homer Avenue, Palo Alto).—I find the set-up for the care of athletic injuries at the University of Southern California is much the same, with individual variations, as the set-up at Stanford University.

The public and the profession have been under the impression that athletic injuries as a whole have been handled in a haphazard manner, principally by trainers and rubbers. This article, therefore, gives some general idea of the facts in connection with athletic injuries as handled by most of the large universities on the Coast.

The treatments used coincide, as a rule, with those of any orthopedic surgeon, with the advantage of seeing the injuries immediately after their occurrence. Thus we are able to apply immediate control measures to hemorrhage and secondary trauma to the damaged tissues; and this, with the youth and enthusiasm of the patients, helps us to complete many rapid recoveries.

## MORTALITY LESSONS IN A SERIES OF 4,029 GYNECOLOGIC OPERATIONS\*†

By HAROLD K. MARSHALL, M.D.

AND

ROBERT H. THOMPSON, M.D.

Glendale

DISCUSSION by L. A. Emge, M.D., San Francisco.

THE value of mortality and morbidity studies is incontrovertible. The periodic audit establishes standards for comparison. Its advantages are many. For the patient, mortalities are reduced. For the surgeon, his illusions are disproved, his surgical conscience aroused and he is stimulated to greater efforts and to the correction of faults. Regular, honest auditing of our surgical results is a basic cornerstone upon which progress rests.

CLINICAL MATERIAL REVIEW: PERIOD FROM  
JULY 1, 1928 TO JULY 1, 1934, AT LOS  
ANGELES COUNTY HOSPITAL

In this paper is presented a review of the deaths on the gynecological service of the Los Angeles County Hospital, covering a period of six years, from July 1, 1928 to July 1, 1934. An analytical study of each case has been made with reference to preoperative status, type of operative procedure and postoperative course.

During the six-year period there were 7,812 patients admitted on the gynecological service, with a total of 183 deaths, an incidence of 2.3 per cent. A total of 3,783 patients were discharged without operation, leaving 4,029 (51.6 per cent) that underwent some type of primary operative procedure. There were 121 deaths in the operated group—a gross operative mortality of 3.0 per cent. Three thousand five hundred and five, or 87 per cent, of these were laparotomies; approximately 17 per cent of which were so-called "double cases," in which abdominal and vaginal plastic work were combined. A total of 524, or 13 per cent, were vaginal cases only. There were 2,352 hysterectomies done, including the three types, subtotal, total, and vaginal, which means that the uterus was removed in 58.4 per cent of all operations performed on the service. The vast majority of these were the subtotal type. There were 83 patients who died following hysterectomy, an incidence of 3.5 per cent.

Anesthesia records were not analyzed for the first three years of the period. During these years ether was used in the majority of cases, but the use of spinal anesthesia was steadily increasing. The last three years, spinal anesthesia was used in almost twice as many cases as was ether.

ARRANGEMENT OF THE SIX COUNTY HOSPITAL  
SERVICES IN GYNECOLOGY

There are six separate services in the gynecologic department, each with its senior and junior attending staff members. During the six-year period, fifteen attending staff members performed

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† A statistical study of patients at the Los Angeles County Hospital (period 1928 to 1934).

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